Actorial Analysis of Ferulic Acid Extraction from Banana Stem Waste

S.N. Ismail and N. Zainol
Faculty of Chemical Engineering and Natural Resources,University Malaysia Pahang,
Lebuhraya Tun Razak,
26300 Kuantan, Pahang, Malaysia
Corresponding author. Tel: +60 9 5492829
Email: s.natrahismail@gmail.com

Abstract
This study analyzed the factor affecting the extraction of ferulic acid (FA) from banana stem waste (BSW). BSW was collected from banana plantation and it was extracted by using sugarcane press machine. Full factorial design (FFD) was used to construct the experimental table and to analyze the influence of all the factors. The factors were part of stem (outer and mixed stem), ultraviolet (UV) light (yes or no), temperature (25-90oC), cycle of extraction (1-3 cycle) and storage time (0-24 h). The FA was analyzed by using high performance liquid chromatography (HPLC) and FA yield ranging from 5.649x10-7 to 1.202 x10-4 g/g. The analysis of the result showed the R2 value for the model was 0.8338 and the part of stem (A), temperature (C) and the interaction between part of stem and temperature (AC) give the high influenced to the extraction with the contribution value were 23.90%, 26.20% and 25.58% respectively. From the validation experiment, the percentage error for predicted and experimental values was 7.67%.

Keywords: Ferulic acid, banana stem waste, full factorial design